

CENTRAL INTELLIGENCE AGENCY

REPORT

# INFORMATION REPORT

CD NO.

COUNTRY USSR (Saratov Oblast)

DATE DISTR.

25X1

SUBJECT Bearing Factory GPZ No. 3 at Saratov

NO. OF PAGES

18

PLACE  
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(LISTED BELOW)

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Attached is [REDACTED] being forwarded as received.

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Comment: Soviet bearings plants are subordinate to the Chief Directorate of the Bearings Industry, which prior to March 1953 was subordinate to the Ministry of the Automobile and Tractor Industry, and since then to the Ministry of Machine Building Industry.

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COUNTRY USSR REPORT

TOPIC Bearing Factory GPS No 3 at Saratov, RSFSR

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EVALUATION  PLACE OBTAINED 

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DATE OF CONTENT DATE OBTAINED  DATE PREPARED 5 July 1955

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REFERENCES PAGES 10 ENCLOSURES (NO. & TYPE) sketches on ditto, with legends

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REMARKS This is UNEVALUATED Information

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1. The exact designation of the plant was Gladki Podzhipnikoi Zavod abbreviated to GPS No 3. Occasionally the plant was also called Shariki Podzhipnikoi Zavod, ball bearing factory.<sup>1</sup>

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After enlargement of the factory on two sides in 1949, the plant covered an area of approximately 1,000 x 800 meters. The plant was located about 1 to 1.5 km from the western bank of the Volga River, 10 to 20 km from the center of Saratov (51°34'N/46°02'E), and south of the Leninskaya -Kamyshin (50°06'N/45°24'E), highway on the southwestern end of the Krekin town section.<sup>2</sup> Along the southeastern main front of the plant ran an 8-meter wide partly macadamized, partly paved main street with a double-track streetcar line which led from the town center to a petroleum distillation plant. This petroleum distillation plant was located on the bank of the Volga approximately 2 km south of the plant. Opposite the main street was an airfield some 1,800 x 1,000 meters across, with an aircraft engine factory at its northeastern side behind which were a tank part factory and a power plant. Some 3 km northeast of subject plant was a small marshalling yard located at the intersection of the Tula (54°12'N/37°36'E) -Uralsk (51°14'N/51°22'E) main railroad line and the Kuibishev - Stalingrad railroad line. One kilometer south of the petroleum distillation plant the double-tracked Uralsk railroad line running along the bank of the Volga branched into two lines, one of them crossed the river on an 800-meter long railroad bridge and led eastwards to Engels (51°30'N/46°05'E). The single-track Stalingrad railroad line ran at about 100 meters distance parallel to the plant. A side line branched off into the plant.<sup>3</sup>

2. The plant was directly subordinated to the Moscow Ministry for Heavy Industry and belonged to a mine trust which included the Moscow ball bearing factories No 1 and No 2 as well as some other six or seven ball bearing factories, which were all operated according to a uniform system of wages, work norms and production norms.

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According to Soviet workers, the plant was built after World War I; according to others, it was erected between 1930 and 1936. [redacted] parts of the Moscow ball bearing factory were transferred to Saratov when the German attack on Moscow seemed imminent. In late 1942, the plant had a 5,000-man labor force including 80 percent women, and a yearly capacity of 2 million ball bearings of all types. In 1943, the plant was bombed by the German Luftwaffe. [redacted] little damage was inflicted; according to others, about 40 percent of the plant were destroyed. The main workshop was out of commission after the attack. By 1944/45, all damage had been repaired. In early 1946, construction work on the second workshop was started. In late 1948, the framework and the machine foundations were completed. Meanwhile some 750 machines dismantled at the Berlin - Erkner ball bearing factory were delivered to Saratov. Production of ball bearings by the new workshops started between late 1949 and early 1950.

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Between 1946 and 1948, a new forge was erected and the existing mechanical workshops were enlarged and modernized. According to the Soviets, the Saratov plant is one of the largest ball bearing plants in the USSR. By 1955, its output is expected to be three times that of the pre-war period. It is believed that a switching-over of the plant to armament purposes in the event of war is not to be expected. According to experts, the plant's equipment would limit such activities to the manufacture of component parts for light arms such as rifles, machine guns, small mortars and possibly small caliber gun barrel blanks.

3. The plant's key installations were the old and the large new production departments. 4
  - a. The old production department, also called Block A measured 300 x 150 meters across and consisted of a complex of buildings including a three-story administration building and the following subdepartments:
    - Subdepartment 11 - Depot of grinding stones, and polishing room
    - Subdepartment 25 - Precision mechanic shop and milling shop manufacturing measuring sets and instruments, tools, gears, and crankshafts.
    - Subdepartment 2 - Foundry for the casting of bearing housings
    - Subdepartment 10 - Workshop manufacturing inner and outer races as well as supporting disks, and assembling and polishing housings
    - Subdepartment 14 - Ball punching, turning and grinding shop
    - Subdepartment 24 - Workshop for the turning, honing and polishing of rollers and pins.
    - Subdepartment 12 - Hardening shop including (a) a hardening shop for balls and rollers, and (b) a hardening shop for races.
    - Subdepartment 16 - Turning shop and assembly shop also called duralumin turning shop, especially designed for the turning, honing and assembly of duralumin races.

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Subdepartment 1 - Workshop for the honing of hardened balls and races, and for the assembly of ball bearings of 2.5 to 8 cm diameter

Subdepartment 13 - Workshop for the honing of hardened races, and for the assembly of ball bearings of over 8 cm diameter.

Subdepartment 15 - Workshop for the honing of hardened races and rollers, and for the assembly of all types of roller and pin bearings.

Control department- checking and acceptance of bearings ready for shipment.

Consumer goods department.

Packing and shipping department.

Laboratory - engaged in experiments with new alloys and new refining methods, and in the development of new testing methods and new grading equipment.

Steel depot.

Metal depot.

Rejects dump.

- b. The new production department, also called Block C, measured 250 x 150 meters across and incorporated all new sub-departments put into operation in 1949/50. A detailed organizational set-up is not available since this department was put into operation by the end of the period under review and observations were made only during construction work or during the installation of machinery. Numerous dismantled German machines arrived as early as 1946/47, mainly from the Berlin Vereinigte Kugellagerfabriken, and from Magdeburg, Chemnitz, and Plauen. The following makes were observed: Intex, Schoette, Hasse, Wrede, Kieserling, Weingarten, Maschinenfabrik Solingen, Maschinenfabrik Esslingen, Maschinenfabrik Goettingen, and Maschinenfabrik Heidenheim. The following machinery was identified:

at the punching sub-department	8 German punching machines
	1 American punching machine
	1 pneumatic hammer
	2 steam forging hammers
in the hardening " "	8 annealing and hardening furnaces
in the turning " "	40 lathes
	10 milling machines
	5 boring machines
	4 to 5 special automatic machines
in the grinding " "	60 to 70 grinding machines
in the honing and assembly"Subdepartment	15 to 18 lathes
	12 grinding machines

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10 polishing machines  
 8 six-spindle lathes  
 8 four-spindle lathes  
 5 to 6 Intex machines

- c. The production departments also included the so-called forge, that is, the old forge, also designated Block E or subdepartment No 17, measuring 150 x 70 meters; and the new forge, also called Block F or subdepartment No 27, measuring 90 x 35 meters. In these subdepartments structural steel and tool steel were forged into rollers, and ball bearing housings were forged and punched, honed and polished. These housings were designed for races of from 4 to 25 cm in diameter and 1.5 to 4 cm high.
- d. Another block was formed by the mechanical workshops including the following subdepartments:
- Subdepartment 7 - mechanical workshop, 100 x 75 meters across, including the repair shop and the blacksmith shop, especially designed for repairing machines and tools.
  - Subdepartment 18 - electrical workshop, also called electric welding shop, 50 x 25 meters across, designed for the repair of electric motors, transformers, electric trucks, terminals, cables and the like, as well as for the assembly of electric aggregates, inductance armatures, and connections for furnaces and baths.
  - Subdepartment 28 - Spare part shop, 120 x 40 meters across, designed for the manufacture of tools and machine spare parts for the plant's own needs.
- Motor vehicle repair shop, 50 x 40 meters across.
- e. Block D included the following buildings:
- Fire station, 80 x 30 meters across, equipped with several fire fighting trucks.
  - Three garages, 50 x 10 meters across.
  - Depot of machinery and spare parts.
- f. Block K was the steel and materials depot, 100 x 25 meters across, for the storage of turning and milling tools, rod and bar steel, strip steel, steel sheets, brass, copper, zinc, lead, and light metals.
- g. Block H included five storage sheds, each measuring 60 x 80 meters. One of the sheds served for the storage of finished products such as bearing housings, rollers, finished roller bearings and several byproducts; the other shed served for the storage of tar paper, plywood, boards, electrodes, electric bulbs, soda, soap, chalk, paints, oakum, professional clothing, etc; the chemical depot contained magnesium, colophony, talcum, paraffin, cyanic compounds, hydrochloric acid and sulfuric acid (in 100 to 200 x 50 liter demijohns); the oil depot contained 8 horizontal 1,000-liter tanks for benzene, kerosene, machine and lubricating oil, and numerous drums filled with lubricants.

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- h. Block J, 30 x 25 meters across, contained several frame saws, a wood-working department, and a boxes manufacturing section.
- i. The plant further included a power plant, 40 x 20 meters across; a transformer station, 8 x 5 meters across; a boiler house, 30 x 15 meters across; a compressor station, 20 x 20 meters across, which delivered compressed air to the forge; a water pumping station, 20 x 8 meters across; a 3-storied administration building, 80 x 25 meters across, containing offices, the kitchen, the mess hall, the first aid station, the sick bays, and several day rooms; a works police station; 2 guard houses, 10 x 10 and 4 x 5 meters respectively; a kennel; a lumber yard, 400 x 150 meters across with several sheds for the storage of boxes, and 2 scrap dumps.

Both production departments, the forge, the boiler house, the compressor house, the power plant and the transformer station as well as the storage sheds had rail connections.

The plant had its own three Diesel locomotives, numerous electric trucks, and two large mobile cranes of American make. Two twin-engine aircraft for the plant's use were at the airfield.

4. The plant's main production line not only included finished ball bearings but also ball bearing housings which were delivered to other plants of the same combine.

The following daily production of bearing housings as well as of inner and outer races was reported:

Outer diameter	Bearing housings	Inner races	Outer Races
2.5 - 8 cm	5,500 - 6,000	11,000 - 12,000	18,000 - 20,000
8 - 15 cm	3,000 - 3,500	5,000 - 6,000	14,000 - 15,000
15 - 38 cm	1,500 - 2,000	2,500 - 3,000	3,000 - 4,000

In early 1950, the output of rollers, balls, and pins amounted to 1 million items per day. The production of balls included sizes of from 2.5 to 42 cm diameter, the sizes of rollers and pins varied from 2 to 60 mm in diameter and 1 to 10 cm length. The over-all output of bearings included 50 percent ball bearings and 50 percent roller and pin bearings. The production program included single and double-row ball bearings, thrust bearings, roller bearings, tapered roller bearings, and pin bearings. It could not be ascertained whether or not barrel-shaped roller bearings were manufactured.

the purposes of the different types of bearings are rather controversial.

ball bearings and roller bearings were designed for installation into trucks, tractors and tanks (especially T-34 tanks), tapered roller bearings and pin bearings were designed for aircraft and aircraft rudder units, ball bearings and thrust bearings were designed for machinery,

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gears and driving mechanism, including marine engines. The following Soviet norm numbers were identified: 308 and 318 for tanks and tractors; 204, 206, 213, 215 and 313 for trucks, tanks and machinery; 508 for speedboats and marine engines.

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	Diameter of balls, and diameter and length of pins and rollers	Outer diameter of race
Ball bearings for tractors	6-25 cm	15 - 22 cm
Roller bearings for tractors and tank track suspension	9 mm and 2.5 cm respectively	20 cm
Roller bearings for aircraft engines	12 mm and 1.8 cm respectively	22.5 cm
Ball bearings for marine engines	22 mm	22.5 cm
Pin bearings	2 - 3 mm and 2.5 cm respectively	2 - 3 cm
Thrust bearings for tank power plants	10 mm and 2.2 cm respectively	11 cm

roller bearing housings for engines and marine engines generally were steel housings, those for tanks, tractors and trucks were brass housings, and those for aircraft engines exclusively were light metal housings or plastic housings of "Pertinax" type material.

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The 1948 daily output of finished roller bearings was estimated at 18 to 20 tons, in 1949/50 some 25 to 30 tons were produced per day. The yearly output of finished bearings was estimated to have reached 3 million items before the new production department was put into operation. Reportedly, the percentage of rejects was very high. A 50 to 70 percent rejects appears doubtful and may apply only to individual working shifts or to the output of unskilled workers at individual machines. A 5- 8 percent of rejects is believed to be correct.

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The finished products were shipped (a) by truck to the Saratov tank and tractor factory, (b) by truck to the previously mentioned airfield from where they proceeded to Moscow or Leningrad, (c) by truck or rail to the Volga River to be loaded into ships to Astrakhan (46°21'N/48°03'E) or Stalingrad, or (d) by rail to the following places of destination: Arkhangelsk (64°34'N/40°32'E), Kharkov (50°00'N/36°15'E), Gorkiy (56°20'N/44°00'E), Kirov (58°33'N/49°42'E), Krasnodar (45°02'N/39°00'E), Karaganda (49°50'N/73°10'E), Molotov (58°00'N/56°15'E), Moscow, Odesa (46°29'N/30°44'E), Omsk (55°00'N/73°24'E), Rostov (47°15'N/39°53'E), Zaporozhe (47°49'N/35°11'E), Stalino (48°00'N/37°48'E), Sverdlovsk (56°50'N/60°38'E), Stalingrad, Tomsk (56°30'N/84°58'E), Ufa (54°43'N/55°58'E) and Warsaw (R 53/ L09).

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\_\_\_\_\_ shipments to Moscow were mainly delivered to the "Red Proletarian" machine factory and the "Stalin" motor vehicle plant. \_\_\_\_\_ two thirds of the shipments were directed to the local tank and tractor plants, according to others, these shipments did not involve more than 20 to 30 percent of the overall output. Some 10 percent of all outgoing shipments were delivered by air, 30 percent on the waterway, and some 60 percent by rail.

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A side line of the production program included the manufacture of annealing furnaces (30 items per month), furnace locks, grinding wheels, sheet metal cans, power transmission poles (150 items per month), hardware such as crockery, pocket knives, and safety locks (160 to 200 tons per month - sict) These products were exclusively shipped by rail at a rate of 35 to 40 tons per month.

5. Power was supplied by the "Sargress" power plant located northeast of the plant via 4 to 6-phase 6,900 kV high voltage lines. A transformer station distributed the power via underground cables to the different workshops. A factory-owned standby generating capacity served peak requirements and was temporarily operated in the afternoon hours. Steam and heating was supplied by the natural-gas burning boiler house connected to the Saratov - Moscow long-distance gas supply line by an underground double piping system 50 cm in diameter. The gas came from Kolegrevka. The power plant also operated with natural gas.

\_\_\_\_\_, the power plant was later switched over to oil-burning. Coal was required only in winter time for heating purposes. The weekly requirements amounted to 800 to 900 tons which were delivered by rail. The coal dump usually held 2 to 4 weeks requirements. Raw materials used at subject plant included: special steel such as round steel, square steel, octagonal steel, flat steel, strip steel, steel sheets, brass rods, copper blocks, lead ingots, aluminum and aluminum alloys, in particular duralumin sheets and rods, as well as plastic materials.

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Special steel was imported \_\_\_\_\_

\_\_\_\_\_ Some of the special steel and rolled material was delivered from the following localities: Kriwoi Rog (47°54'N/33°21'E), Magnitogorsk (53°27'N/59°04'E), Rostov, Stalingrad, and Voronezh (51°38'N/39°12'E). All incoming shipments arrived by rail. Weekly deliveries of 500 to 600 tons of steel in addition to 200 to 250 tons of non-ferrous metals and plastics were observed. There was ample supply of raw materials and large quantities of steel, copper and brass scrap were observed at the scrap dumps. Chemicals were in short supply, the stocks became depleted several times a year and the neighboring aircraft factory had to fall in. Approximately 20 tons of chemicals were delivered per quarter of a year. A weekly delivery of 20 demijohns of hydrochloric acid and sulfuric acid was reported.

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6. In 1945/46, there was an overall work force of 2,000 PWs in addition to some 3,000 Soviet workers. In 1946, the PWs were mostly replaced by Soviet forced laborers. In 1947, the number of PWs employed at the plant had decreased to 900 to 1,000. In 1948, this figure had dropped

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to between 700 and 800. In 1949, the labor force had to be increased and amounted to 5,000 Soviets in addition to 600 PWs. Between late 1949 and early 1950, when the new production department was put into operation, the employment of PWs at production work was prohibited. Nevertheless, PWs were employed as special workers until 1950. Whenever inspection committees arrived, these PWs were temporarily removed from their working places. In 1950, the enterprise had a 6,500 to 7,000-men labor force. Some [ ] estimated this figure as high as 8,000. It was expected to be raised in the subsequent years in connection with the raised production targets. Except at the administration, at the magazine and the repair shops, three daily 8-hour shifts were worked, with one free day per week. If the targets were not reached the shifts were prolonged for allegedly 10 to 12 hours, in particular for forced laborers and PWs. Some 2,500 persons worked the day shifts, some 1,500 to 2,000 worked the night shifts. In Block A, some 500 to 600 special workers were employed per shift, in Block C from 300 to 400, at the forge some 120 to 150, and in the mechanical workshops some 100 to 130. The number of skilled workers (gelernter Facharbeiter) per shift was estimated at 600, that of trained special workers (angelernter Spezialarbeiter) at 800 per shift. The workforce consisted of 70 percent Byelorussians and 20 percent Ukrainians; the remainder was made up of Georgians, Tatars and Kalmucks. A proportion of 30 to 40 percent of forced laborers and deportees was reported. The percentage of females was estimated at between 40 and 70 percent. The proportion of the 17 -20 years age group was estimated at 25 percent. It is believed that the work force included 50 to 60 percent females and younger people.

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By the end of the period under observation, Colonel Orlov (fnu), allegedly a former airforce colonel, was manager of the plant. He usually wore civilian clothes and was held in great esteem by the laborers. He was said to have been assigned to his post by Stalin himself with the mission of improving workmanship and increasing the output of the plant. One Popov (fnu) was MVD chief of the plant. One Migaretzki (fnu) was chief of the shipping department. One Schuster (fnu), a former German officer of World War I who had become a Soviet citizen was instructor for the engine fitters.

Military inspection committees used to visit the plant once or twice a week. These committees consisted of tank and airforce officers as well as army engineering officers. Occasionally the committees were headed by a general. Several control officers were permanently stationed at the administration building.

7. To the street front, the plant was surrounded by a 2 to 2.5-meter high brick wall, to the three other sides there was a 2-meter high board fence. Permanently guarded watch towers were placed at regular intervals of 200 to 250 meters. At 1 meter from the inner side of the fence ran a mesh wire and barbed wire fence. The space between the two fences was regularly patrolled by guards which at night were accompanied by dogs. The main gate, the secondary gates and the railroad gate were guarded

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by platoons of 6 to 12 men. Special guards were placed at the entrances to the production shops, the boiler house, the power plant, and the most important mechanical workshops and storage sheds. During the night, guards patrolled throughout the plant.

The workmen were equipped with identification cards and special permits for special departments. Checking was rigid. At intervals, body searches of males and females were performed. All entrances to the plant were checked by military posts or MVD. The other controls were performed by the civilian work police which wore dark blue uniforms without insignia and were armed with pistols or carbines. The patrols were equipped with carbines. The work police consisted mostly of women.

During the period under observation, all buildings were painted a grayish-white for air protection reasons. No active air protection measures were observed including AA guns. The roofs of the larger buildings, however, were at all four corners equipped with concrete platforms capable to support heavy AA guns. "Paternoster" elevators led from the workshops to these platforms. No air raid shelters were observed. The plant had its own fire brigade. The fire station was equipped with at least two fire fighting trucks. 12 to 15 modern fire fighting trucks with trailers were available. 5

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1. Comment. According to other reports, the official denomination of subject plant is Gosudarstvenny Podshipnikovy Savod = State Ball Bearing Factory. The term Gladki probably is a misinterpretation of Gosudarstvennyi. Shariki Podzhipnikoi is a misinterpretation of Shariko Podzhipnikovyi = ball bearing.

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2. Comment. The town section Krekin (cracking) derives its name from the cracking plant located there.

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3. Comment. For location sketch of the plant, see Annex 1 which was prepared according to data furnished

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4. Comment. For layout sketch of the plant, see Annex 2 which was prepared according to data furnished

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5. Comment. The detailed informations agree with earlier information. The plant is part of the combine which also includes the Moscow ball bearing factory, the Kuibishev ball bearing factory and other similar plants. Extensive damage incurred in 1943 by a German air attack were repaired by the end of the war and the pre-war capacity was regained. In the post-war years, production was stepped up considerably by enlarging and rationalizing the installation.

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During the war period, the output amounted to a daily 15 tons of bearings. The percentage of rejects which was indeed very high was caused by the enforcement of excessive norms at the expense of the quality, as well as by inadequate training of the workers, and the lack of standardization. By reducing the number of types to 153 and

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corresponding adjustment of machinery, the 1948/49 production output was raised 25 to 30 percent. In 1951, new working methods cut the number of operations per finished item to one-eighth and simultaneously raised the productivity. According to Soviet reports, the 1949 and 1950 plan fulfilment was accompanied by a reduction of the proportion of rejects from 3 to 0.1 percent. The output was twice as high as during the war period. By 1949, the labor force had increased to 6,000 persons and a further considerable increase was expected. During the war, Colonel Orlov was manager of the plant. According to earlier reports, the plant's machine equipment included: 120 punching machines, 220 lathes, 180 grinding machines, 50 boring machines, 40 milling machines, and 80 automatic lathes.

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Annex 1

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For legend, see next page

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Annex 1

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Location Sketch of GPS No 3 Saratov Ball Bearing Factory.Legend.

- 1 - Ball bearing factory No 3
- 2 - Petroleum distillation plant
- 3 - Agricultural machine factory
- 4 - Aircraft engine works "Kombaino" No 292
- 5 - Tank part factory No 400
- 6 - Power plant
- 7 - Shoe factory
- 8 - Mattress factory
- 9 - "Ubek" fuel depot (sic)
- 10 - "Nefte Base" fuel depot
- 11 - Gasoline depot
- 12 - Grain siloes
- 13 - Pushkin theatre
- 14 - Housing units
- 15 - Institute for Road Construction
- 16 - Natural gas research institute
- 17 - Main street with streetcar line leading to town center
- 18 - Leninskaya Ulidza
- 19 - Astrakhanskaya Ulidza
- 20 - Road to Kamyshin
- 21 - Airfield
- 22 - Shunting station and freight yard
- 23 - Tula -Uralsk railroad line
- 24 - Kuibyshev-Stalingrad railroad line
- 25 - Railroad bridge
- 26 - Sand pit

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Annex 2

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Annex 2

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Layout Sketch of GPS No 3 Saratov Ball Bearing FactoryLegend.

- 1 - Block A - old production department
- a. Subdepartment 11 - storage of grinding stones and polishing shop
  - b. Subdepartment 25 - Precision mechanic shop and milling shop equipped with 5 milling machines, 10 lathes, 12 to 15 boring and planing machines, and 1 Italian grinding machine
  - c. Subdepartment 2 - foundry equipped with an electric steel furnace, 3 large cupola furnaces for iron and steel casting, 1 small smelting furnace, and 10 to 12 punches.
  - d. Subdepartment 10 - Race punching shop equipped with 2 sheet metal cutting machines, 15 punch presses, 1 oil and acid bath.
  - e. Subdepartment 14 - Ball punching, turning and grinding shop equipped with a heavy ball punch, 3 small ball punches, and 5 German grinding machines.
  - f. Subdepartment 24 - Roller turning and grinding shop equipped with 18 automatic machines, 20 to 25 German and American grinding machines, 5 to 10 polishing and honing machines, 1 oil bath.
  - g. Subdepartment 12 - hardening shop equipped with 12 German hardening furnaces, 8 Russian and Italian (Falschi) hardening furnaces, 4 electromagnetic Siemens hardening furnaces, 3 ladles, and 1 oil bath.
  - h. Subdepartment 16 - turning and assembly shop equipped with several modern lathes.

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- i. Subdepartment 1 - Assembly shop for ball bearings with a race diameter of up to 8 cm, equipped with 15 to 20 lathes, 28 automatic machines, and numerous autogenous and electric welding units.
- k. Subdepartment 13 - Assembly shop for ball bearings with races of over 8 cm in diameter, equipped with 24 lathes, 50 grinding machines, numerous polishing and conditioning machines, 15 automatic machines from Plauen and Chemnitz, and numerous welding units.
- l. Subdepartment 15 - Assembly shop for roller and pin bearings equipped with 5 circular lathes, 4 to 5 American 2 to 3-meter lathes, 12 to 13 German turret lathes, 3 carpenter's benches, 4 to 5 rolling machines, 10 to 12 German automatic machines, 6 American automatic machines, and autogenous and electric welding units.
- m. Control shop equipped with 7 or 8 testing units.
- n. Consumer goods depot
- o. Packing room
- p. Laboratory
- q. Steel depot
- r. Metal depot
- s. Rejects dump

- 2 - Block C - New production department equipped with 8 annealing and hardening furnaces, 1 pneumatic hammer, 2 steam hammers, 9 punching machines (8 of them of German make, 1 of American make), about 60 lathes, 60 to 70 grinding machines, several curvature grinding machines, numerous rolling machines, 10 polishing machines, several automatic extrusion presses, 15 to 20 planing and milling machines, 10 to 12 boring machines, 16 four-spindle and six-spindle lathes, 4 to 5 special automatic machines, and 5 to 6 Intex machines.

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Annex 2

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- 3 - Department 17 - old forge
- 4 - Department 27 - new forge

The two forges were equipped with one 5-ton electric traveling crane, 12 foundry furnaces and forging furnaces, 9 electric annealing furnaces (one of American make, the other 8 Jungnickel-Solingen make), 40 hardening furnaces, 1 large powered pneumatic hammer, 3 small powered pneumatic hammers, 2 x 3-ton steam hammers, 3 x 2-ton steam hammers, 4 large pneumatic forging presses, 12 high-speed presses (four of them of American make, the other eight of Koenig & Bauer make), 4 to 5 large punching machines (one American and seven of Russian make), 7 Soviet punching machines, 8 to 9 small punches (four of them of American "National" make), 5 to 6 lathes, 2 race expanding machines, 12 grinding machines, 2 to 3 automatic machines from Saxony.

- 5 - Department 7 - mechanical workshop equipped with 2 annealing furnaces, 1 light press, 40 lathes, 1 spindle lathe, 10 milling machines, 5 boring machines, 2 lathes, 1 punching machine, 1 fly cutter, 5 special automatic machines of Swedish and American make.
- 6 - Department 18 - electrical workshop equipped with one 5-ton electric truck, electric machines, tools and appliances of Siemens-Schuckert make.
- 7 - Department 28 - machinery and spare part shop equipped with 1 heavy traveling crane, 4 annealing furnaces, 4 hardening furnaces, 2 pneumatic hammers, 4 German special lathes, 7 conventional lathes, 1 engine lathe, 1 carpenter's bench, 4 planing machines of Fischer make, 10 boring machines, 2 milling machines, 2 small shaping machines, 4 punches, 2 sheet metal rolls, 2 iron saws, 5 welding units.
- 8 - Motor vehicle repair shop
- 9 - Fire brigade

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- 10 - Garages accomodating several 4-ton and 6-ton Buessing, NAG, and Krupp trucks, 5 ZIS 5-ton trucks including 2 tipping trucks, 24 ZIS 3-ton trucks, 8 to 10 Ford 2-ton and 3-ton trucks, 15 ZIS 1.5-ton trucks, 3 Stalinez Diesel tractors, 1 American caterpillar tractor, 1 American tank transformed into a tractor, 2 six-seater ZIS sedans, 1 "Pobeda" ZIS sedan, 2 old ZIS sedans.
- 11 - Machine and spare part depot
- 12 - Block K - steel and materials depot
- 13 - Finished products depot
- 14 - Supply depot
- 15 - Small iron parts depot
- 16 - Chemical depot
- 17 - Oil depot
- 18 - Block J - Saw mill, wood-working department and box factory
- 19 - Power plant with 2 turbines
- 20 - Transformer station with 6 transformers
- 21 - Boiler house equipped with 7 to 8 semiportable boilers, and 3 natural-gas burning boilers
- 22 - Compressor station
- 23 - Water pumping station and water reservoir
- 24 - Administration building containing offices, kitchen, mess hall, first aid station, sick bay, and day rooms
- 25 - Block L - factory police station
- 26 - Two guard houses
- 27 - Kennel
- 28 - Lumber yard
- 29 - Two scrap dumps
- 30 - Rail connections
- 31 - High voltage line

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CENTRAL INTELLIGENCE AGENCY

REPORT

## INFORMATION REPORT

CD NO.

25X1

COUNTRY USSR (Saratov Oblast)

DATE DISTR.

SUBJECT Bearing Factory GPZ No. 3 at Saratov

NO. OF PAGES 18

PLACE  
ACQUIREDNO. OF ENCLS.  
(LISTED BELOW)

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DATE OF  
INFO.SUPPLEMENT TO  
REPORT NO.

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Attached is [redacted] being forwarded as received.

**Comment:** Soviet bearings plants are subordinate to the Chief  
Directorate of the Bearings Industry, which prior to March 1953 was sub-  
ordinate to the Ministry of the Automobile and Tractor Industry, and since  
then to the Ministry of Machine Building Industry.

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STATE	<input checked="" type="checkbox"/>	NAVY	<input checked="" type="checkbox"/>	NSRB															
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CLASSIFICATION CONFIDENTIALCOUNTRY USSR REPORTTOPIC Bearing Factory GPS No 3 at Saratov, RSFSR

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EVALUATION                      PLACE OBTAINED                     

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DATE OF CONTENT                     DATE OBTAINED                      DATE PREPARED 5 July 1955REFERENCES                     PAGES 10 ENCLOSURES (NO. & TYPE) sketches on ditto, with legends

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REMARKS This is UNEVALUATED Information

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1. The exact designation of the plant was Gladki Podzhipnikoi Zavod abbreviated to GPS No 3. Occasionally the plant was also called Shariki Podzhipnikoi Zavod, ball bearing factory.<sup>1</sup>

After enlargement of the factory on two sides in 1949, the plant covered an area of approximately 1,000 x 800 meters. The plant was located about 1 to 1.5 km from the western bank of the Volga River, 10 to 20 km from the center of Saratov (51°34'N/46°02'E), and south of the Leninskaya -Kamyshin (50°06'N/45°24'E) highway on the southwestern end of the Krekin town section.<sup>2</sup> Along the southeastern main front of the plant ran an 8-meter wide partly macadamized, partly paved main street with a double-track streetcar line which led from the town center to a petroleum distillation plant. This petroleum distillation plant was located on the bank of the Volga approximately 2 km south of the plant. Opposite the main street was an airfield some 1,800 x 1,000 meters across, with an aircraft engine factory at its northeastern side behind which were a tank part factory and a power plant. Some 3 km northeast of subject plant was a small marshalling yard located at the intersection of the Tula (54°12'N/37°36'E) -Uralsk (51°14'N/51°22'E) main railroad line and the Kuibishev - Stalingrad railroad line. One kilometer south of the petroleum distillation plant the double-tracked Uralsk railroad line running along the bank of the Volga branched into two lines, one of them crossed the river on an 800-meter long railroad bridge and led eastwards to Engels (51°30'N/46°05'E). The single-track Stalingrad railroad line ran at about 100 meters distance parallel to the plant. A side line branched off into the plant.<sup>3</sup>

2. The plant was directly subordinated to the Moscow Ministry for Heavy Industry and belonged to a mine trust which included the Moscow ball bearing factories No 1 and No 2 as well as some other six or seven ball bearing factories, which were all operated according to a uniform system of wages, work norms and production norms.

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According to Soviet workers, the plant was built after World War I; according to others, it was erected between 1930 and 1936.

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parts of the Moscow ball bearing factory were transferred to Saratov when the German attack on Moscow seemed imminent. In late 1942, the plant had a 5,000-man labor force including 80 percent women, and a yearly capacity of 2 million ball bearings of all types. In 1943, the plant was bombed by the German Luftwaffe. little damage was inflicted; according to others, about 40 percent of the plant were destroyed. The main workshop was out of commission after the attack. By 1944/45, all damage had been repaired. In early 1946, construction work on the second workshop was started. In late 1948, the framework and the machine foundations were completed. Meanwhile some 750 machines dismantled at the Berlin - Erkner ball bearing factory were delivered to Saratov. Production of ball bearings by the new workshops started between late 1949 and early 1950.

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Between 1946 and 1948, a new forge was erected and the existing mechanical workshops were enlarged and modernized. According to the Soviets, the Saratov plant is one of the largest ball bearing plants in the USSR. By 1955, its output is expected to be three times that of the pre-war period. It is believed that a switching-over of the plant to armament purposes in the event of war is not to be expected. According to experts, the plant's equipment would limit such activities to the manufacture of component parts for light arms such as rifles, machine guns, small mortars and possibly small caliber gun barrel blanks.

3. The plant's key installations were the old and the large new production departments. 4
  - a. The old production department, also called Block A measured 300 x 150 meters across and consisted of a complex of buildings including a three-story administration building and the following subdepartments:
    - Subdepartment 11 - Depot of grinding stones, and polishing room
    - Subdepartment 25 - Precision mechanic shop and milling shop manufacturing measuring sets and instruments, tools, gears, and crankshafts.
    - Subdepartment 2 - Foundry for the casting of bearing housings
    - Subdepartment 10 - Workshop manufacturing inner and outer races as well as supporting disks, and assembling and polishing housings
    - Subdepartment 14 - Ball punching, turning and grinding shop
    - Subdepartment 24 - Workshop for the turning, honing and polishing of rollers and pins.
    - Subdepartment 12 - Hardening shop including (a) a hardening shop for balls and rollers, and (b) a hardening shop for races.
    - Subdepartment 16 - Turning shop and assembly shop also called duralumin turning shop, especially designed for the turning, honing and assembly of duralumin races.

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- Subdepartment 1 - Workshop for the honing of hardened balls and races, and for the assembly of ball bearings of 2.5 to 8 cm diameter
- Subdepartment 13 - Workshop for the honing of hardened races, and for the assembly of ball bearings of over 8 cm diameter.
- Subdepartment 15 - Workshop for the honing of hardened races and rollers, and for the assembly of all types of roller and pin bearings.
- Control department- checking and acceptance of bearings ready for shipment.
- Consumer goods department.
- Packing and shipping department.
- Laboratory - engaged in experiments with new alloys and new refining methods, and in the development of new testing methods and new grading equipment.
- Steel depot.
- Metal depot.
- Rejects dump.

- b. The new production department, also called Block C, measured 250 x 150 meters across and incorporated all new sub-departments put into operation in 1949/50. A detailed organizational set-up is not available since this department was put into operation by the end of the period under review and observations were made only during construction work or during the installation of machinery. Numerous dismantled German machines arrived as early as 1946/47, mainly from the Berlin Vereinigte Kugellagerfabriken, and from Magdeburg, Chemnitz, and Plauen. The following makes were observed: Intex, Schoette, Hasse, Wrede, Kieserling, Weingarten, Maschinenfabrik Solingen, Maschinenfabrik Esslingen, Maschinenfabrik Goettingen, and Maschinenfabrik Heidenheim. The following machinery was identified:

at the punching sub-department	8 German punching machines
	1 American punching machine
	1 pneumatic hammer
	2 steam forging hammers
in the hardening " "	8 annealing and hardening furnaces
in the turning " "	40 lathes
	10 milling machines
	5 boring machines
	4 to 5 special automatic machines
in the grinding " "	60 to 70 grinding machines
in the honing and assembly subdepartment	15 to 18 lathes
	12 grinding machines

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10 polishing machines  
 8 six-spindle lathes  
 8 four-spindle lathes  
 5 to 6 Intex machines

- c. The production departments also included the so-called forge, that is, the old forge, also designated Block E or subdepartment No 17, measuring 150 x 70 meters; and the new forge, also called Block F or subdepartment No 27, measuring 90 x 35 meters. In these subdepartments structural steel and tool steel were forged into rollers, and ball bearing housings were forged and punched, honed and polished. These housings were designed for races of from 4 to 25 cm in diameter and 1.5 to 4 cm high.

- d. Another block was formed by the mechanical workshops including the following subdepartments:

Subdepartment 7 - mechanical workshop, 100 x 75 meters across, including the repair shop and the blacksmith shop, especially designed for repairing machines and tools.

Subdepartment 18 - electrical workshop, also called electric welding shop, 50 x 25 meters across, designed for the repair of electric motors, transformers, electric trucks, terminals, cables and the like, as well as for the assembly of electric aggregates, inductance armatures, and connections for furnaces and baths.

Subdepartment 28 - Spare part shop, 120 x 40 meters across, designed for the manufacture of tools and machine spare parts for the plant's own needs.

Motor vehicle repair shop, 50 x 40 meters across.

- e. Block D included the following buildings:

Fire station, 80 x 30 meters across, equipped with several fire fighting trucks.

Three garages, 50 x 10 meters across.

Depot of machinery and spare parts.

- f. Block K was the steel and materials depot, 100 x 25 meters across, for the storage of turning and milling tools, rod and bar steel, strip steel, steel sheets, brass, copper, zinc, lead, and light metals.

- g. Block H included five storage sheds, each measuring 60 x 80 meters. One of the sheds served for the storage of finished products such as bearing housings, rollers, finished roller bearings and several byproducts; the other shed served for the storage of tar paper, plywood, boards, electrodes, electric bulbs, soda, soap, chalk, paints, oakum, professional clothing, etc; the chemical depot contained magnesium, colophony, talcum, paraffin, cyanic compounds, hydrochloric acid and sulfuric acid (in 100 to 200 x 50 liter demijohns); the oil depot contained 8 horizontal 1,000-liter tanks for benzene, kerosene, machine and lubricating oil, and numerous drums filled with lubricants.

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- h. Block J, 30 x 25 meters across, contained several frame saws, a wood-working department, and a boxes manufacturing section.
- i. The plant further included a power plant, 40 x 20 meters across; a transformer station, 8 x 5 meters across; a boiler house, 30 x 15 meters across; a compressor station, 20 x 20 meters across, which delivered compressed air to the forge; a water pumping station, 20 x 8 meters across; a 3-storied administration building, 80 x 25 meters across, containing offices, the kitchen, the mess hall, the first aid station, the sick bays, and several day rooms; a works police station; 2 guard houses, 10 x 10 and 4 x 5 meters respectively; a kennel; a lumber yard, 400 x 150 meters across with several sheds for the storage of boxes, and 2 scrap dumps.

Both production departments, the forge, the boiler house, the compressor house, the power plant and the transformer station as well as the storage sheds had rail connections.

The plant had its own three Diesel locomotives, numerous electric trucks, and two large mobile cranes of American make. Two twin-engine aircraft for the plant's use were at the airfield.

4. The plant's main production line not only included finished ball bearings but also ball bearing housings which were delivered to other plants of the same combine.

The following daily production of bearing housings as well as of inner and outer races was reported:

Outer diameter	Bearing housings	Inner races	Outer Races
2.5 - 8 cm	5,500 - 6,000	11,000 - 12,000	18,000 - 20,000
8 - 15 cm	3,000 - 3,500	5,000 - 6,000	14,000 - 15,000
15 - 38 cm	1,500 - 2,000	2,500 - 3,000	3,000 - 4,000

In early 1950, the output of rollers, balls, and pins amounted to 1 million items per day. The production of balls included sizes of from 2.5 to 42 cm diameter, the sizes of rollers and pins varied from 2 to 60 mm in diameter and 1 to 10 cm length. The over-all output of bearings included 50 percent ball bearings and 50 percent roller and pin bearings. The production program included single and double-row ball bearings, thrust bearings, roller bearings, tapered roller bearings, and pin bearings. It could not be ascertained whether or not barrel-shaped roller bearings were manufactured.

the purposes of the different types of bearings are rather controversial. ball bearings and roller bearings were designed for installation into trucks, tractors and tanks (especially T-34 tanks), tapered roller bearings and pin bearings were designed for aircraft and aircraft rudder units, ball bearings and thrust bearings were designed for machinery,

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gears and driving mechanism, including marine engines. The following Soviet norm numbers were identified: 308 and 318 for tanks and tractors; 204, 206, 213, 215 and 313 for trucks, tanks and machinery; 508 for speedboats and marine engines.

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	Diameter of balls, and diameter and length of pins and rollers	Outer diameter of race
Ball bearings for tractors	6-25 cm	15 - 22 cm
Roller bearings for tractors and tank track suspension	9 mm and 2.5 cm respectively	20 cm
Roller bearings for aircraft engines	12 mm and 1.8 cm respectively	22.5 cm
Ball bearings for marine engines	22 mm	22.5 cm
Pin bearings	2 - 3 mm and 2.5 cm respectively	2 - 3 cm
Thrust bearings for tank power plants	10 mm and 2.2 cm respectively	11 cm

roller bearing housings for engines and marine engines generally were steel housings, those for tanks, tractors and trucks were brass housings, and those for aircraft engines exclusively were light metal housings or plastic housings of "Pertinax" type material.

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The 1948 daily output of finished roller bearings was estimated at 18 to 20 tons, in 1949/50 some 25 to 30 tons were produced per day. The yearly output of finished bearings was estimated to have reached 3 million items before the new production department was put into operation. Reportedly, the percentage of rejects was very high. A 50 to 70 percent rejects appears doubtful and may apply only to individual working shifts or to the output of unskilled workers at individual machines. A 5- 8 percent of rejects is believed to be correct.

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The finished products were shipped (a) by truck to the Saratov tank and tractor factory, (b) by truck to the previously mentioned airfield from where they proceeded to Moscow or Leningrad, (c) by truck or rail to the Volga River to be loaded into ships to Astrakhan (46°21'N/48°03'E) or Stalingrad, or (d) by rail to the following places of destination: Arkhangelsk (64°34'N/40°32'E), Kharkov (50°00'N/36°15'E), Gorkiy (56°20'N/44°00'E), Kirov (58°33'N/49°42'E), Krasnodar (45°02'N/39°00'E), Karaganda (49°50'N/73°10'E), Molotov (58°00'N/56°15'E), Moscow, Odesa (46°29'N/30°44'E), Omsk (55°00'N/73°24'E), Rostov (47°15'N/39°53'E), Zaporozhe (47°49'N/35°11'E), Stalino (48°00'N/37°48'E), Sverdlovsk (56°50'N/60°38'E), Stalingrad, Tomsk (56°30'N/84°58'E), UFA (54°43'N/55°58'E) and Warsaw (R 53/ L09).

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[redacted] shipments to Moscow were mainly delivered to the "Red Proletarian" machine factory and the "Stalin" motor vehicle plant. [redacted] two thirds of the shipments were directed to the local tank and tractor plants, according to others, these shipments did not involve more than 20 to 30 percent of the overall output. Some 10 percent of all outgoing shipments were delivered by air, 30 percent on the waterway, and some 60 percent by rail.

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A side line of the production program included the manufacture of annealing furnaces (30 items per month), furnace locks, grinding wheels, sheet metal cans, power transmission poles (150 items per month), hardware such as crockery, pocket knives, and safety locks (160 to 200 tons per month - sic!) These products were exclusively shipped by rail at a rate of 35 to 40 tons per month.

5. Power was supplied by the "Sargress" power plant located northeast of the plant via 4 to 6-phase 6,900 kV high voltage lines. A transformer station distributed the power via underground cables to the different workshops. A factory-owned standby generating capacity served peak requirements and was temporarily operated in the afternoon hours. Steam and heating was supplied by the natural-gas burning boiler house connected to the Saratov - Moscow long-distance gas supply line by an underground double piping system 50 cm in diameter. The gas came from Kolegrevka. The power plant also operated with natural gas.

[redacted] the power plant was later switched over to oil-burning. Coal was required only in winter time for heating purposes. The weekly requirements amounted to 800 to 900 tons which were delivered by rail. The coal dump usually held 2 to 4 weeks requirements. Raw materials used at subject plant included: special steel such as round steel, square steel, octagonal steel, flat steel, strip steel, steel sheets, brass rods, copper blocks, lead ingots, aluminum and aluminum alloys, in particular duralumin sheets and rods, as well as plastic materials.

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Special steel was imported [redacted]

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Some of the special steel and rolled material was delivered from the following localities: Kriwoi Rog (47°54'N/33°21'E), Magnitogorsk (53°27'N/59°04'E), Rostov, Stalingrad, and Voronesh (51°38'N/39°12'E). All incoming shipments arrived by rail. Weekly deliveries of 500 to 600 tons of steel in addition to 200 to 250 tons of non-ferrous metals and plastics were observed. There was ample supply of raw materials and large quantities of steel, copper and brass scrap were observed at the scrap dumps. Chemicals were in short supply, the stocks became depleted several times a year and the neighboring aircraft factory had to fall in. Approximately 20 tons of chemicals were delivered per quarter of a year. A weekly delivery of 20 demijohns of hydrochloric acid and sulfuric acid was reported.

6. In 1945/46, there was an overall work force of 2,000 PWs in addition to some 3,000 Soviet workers. In 1946, the PWs were mostly replaced by Soviet forced laborers. In 1947, the number of PWs employed at the plant had decreased to 900 to 1,000. In 1948, this figure had dropped

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to between 700 and 800. In 1949, the labor force had to be increased and amounted to 5,000 Soviets in addition to 600 PWs. Between late 1949 and early 1950, when the new production department was put into operation, the employment of PWs at production work was prohibited. Nevertheless, PWs were employed as special workers until 1950. Whenever inspection committees arrived, these PWs were temporarily removed from their working places. In 1950, the enterprise had a 6,500 to 7,000-men labor force. Some [ ] estimated this figure as high as 8,000. It was expected to be raised in the subsequent years in connection with the raised production targets. Except at the administration, at the magazine and the repair shops, three daily 8-hour shifts were worked, with one free day per week. If the targets were not reached the shifts were prolonged for allegedly 10 to 12 hours, in particular for forced laborers and PWs. Some 2,500 persons worked the day shifts, some 1,500 to 2,000 worked the night shifts. In Block A, some 500 to 600 special workers were employed per shift, in Block C from 300 to 400, at the forge some 120 to 150, and in the mechanical workshops some 100 to 130. The number of skilled workers (gelernter Facharbeiter) per shift was estimated at 600, that of trained special workers (angelernter Spezialarbeiter) at 800 per shift. The workforce consisted of 70 percent Byelorussians and 20 percent Ukrainians; the remainder was made up of Georgians, Tatars and Kalmucks. A proportion of 30 to 40 percent of forced laborers and deportees was reported. The percentage of females was estimated at between 40 and 70 percent. The proportion of the 17 -20 years age group was estimated at 25 percent. It is believed that the work force included 50 to 60 percent females and younger people.

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By the end of the period under observation, Colonel Orlov (fnu), allegedly a former airforce colonel, was manager of the plant. He usually wore civilian clothes and was held in great esteem by the laborers. He was said to have been assigned to his post by Stalin himself with the mission of improving workmanship and increasing the output of the plant. One Popov (fnu) was MVD chief of the plant. One Migaretzki (fnu) was chief of the shipping department. One Schuster (fnu), a former German officer of World War I who had become a Soviet citizen was instructor for the engine fitters.

Military inspection committees used to visit the plant once or twice a week. These committees consisted of tank and airforce officers as well as army engineering officers. Occasionally the committees were headed by a general. Several control officers were permanently stationed at the administration building.

7. To the street front, the plant was surrounded by a 2 to 2.5-meter high brick wall, to the three other sides there was a 2-meter high board fence. Permanently guarded watch towers were placed at regular intervals of 200 to 250 meters. At 1 meter from the inner side of the fence ran a mesh wire and barbed wire fence. The space between the two fences was regularly patrolled by guards which at night were accompanied by dogs. The main gate, the secondary gates and the railroad gate were guarded

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by platoons of 6 to 12 men. Special guards were placed at the entrances to the production shops, the boiler house, the power plant, and the most important mechanical workshops and storage sheds. During the night, guards patrolled throughout the plant.

The workmen were equipped with identification cards and special permits for special departments. Checking was rigid. At intervals, body searches of males and females were performed. All entrances to the plant were checked by military posts or MVD. The other controls were performed by the civilian work police which wore dark blue uniforms without insignia and were armed with pistols or carbines. The patrols were equipped with carbines. The work police consisted mostly of women.

During the period under observation, all buildings were painted a grayish-white for air protection reasons. No active air protection measures were observed including AA guns. The roofs of the larger buildings, however, were at all four corners equipped with concrete platforms capable to support heavy AA guns. "Paternoster" elevators led from the workshops to these platforms. No air raid shelters were observed. The plant had its own fire brigade. The fire station was equipped with at least two fire fighting trucks. [redacted] 12 to 15 modern fire fighting trucks with trailers were available. 5

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1. [redacted] Comment. According to other reports, the official denomination of subject plant is Gosudarstvenny Podshipnikovyi Savod = State Ball Bearing Factory. The term Gladki probably is a misinterpretation of Gosudarstvennyi. Shariki Podzhipnikoi is a misinterpretation of Shariko Podzhipnikovyi = ball bearing.

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2. [redacted] Comment. The town section Krekin (cracking) derives its name from the cracking plant located there.

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3. [redacted] Comment. For location sketch of the plant, see Annex 1 which was prepared according to data furnished [redacted]

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4. [redacted] Comment. For layout sketch of the plant, see Annex 2 which was prepared according to data furnished [redacted]

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5. [redacted] Comment. The detailed informations [redacted] agree with earlier information. The plant is part of the combine which also includes the Moscow ball bearing factory, the Kuibishev ball bearing factory and other similar plants. Extensive damage incurred in 1943 by a German air attack were repaired by the end of the war and the pre-war capacity was regained. In the post-war years, production was stepped up considerably by enlarging and rationalizing the installation.

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During the war period, the output amounted to a daily 15 tons of bearings. The percentage of rejects which was indeed very high was caused by the enforcement of excessive norms at the expense of the quality, as well as by inadequate training of the workers, and the lack of standardization. By reducing the number of types to 153 and

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corresponding adjustment of machinery, the 1948/49 production output was raised 25 to 30 percent. In 1951, new working methods cut the number of operations per finished item to one-eighth and simultaneously raised the productivity. According to Soviet reports, the 1949 and 1950 plan fulfilment was accompanied by a reduction of the proportion of rejects from 3 to 0.1 percent. The output was twice as high as during the war period. By 1949, the labor force had increased to 6,000 persons and a further considerable increase was expected. During the war, Colonel Orlov was manager of the plant. According to earlier reports, the plant's machine equipment included: 120 punching machines, 220 lathes, 180 grinding machines, 50 boring machines, 40 milling machines, and 80 automatic lathes.

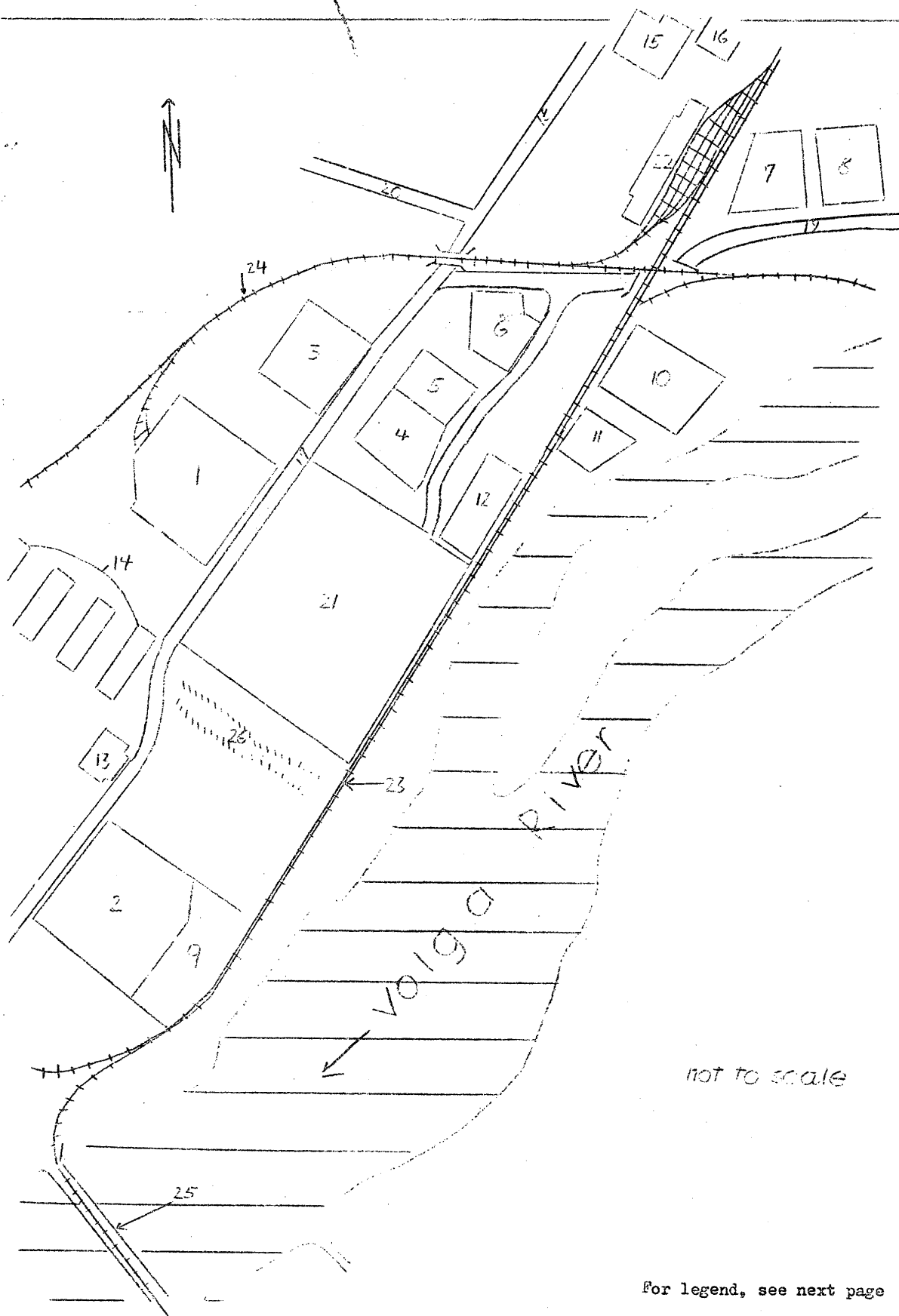
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Annex 1

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Annex 1

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Location Sketch of GPS No 3 Saratov Ball Bearing Factory.

Legend.

- 1 - Ball bearing factory No 3
- 2 - Petroleum distillation plant
- 3 - Agricultural machine factory
- 4 - Aircraft engine works "Kombaino" No 292
- 5 - Tank part factory No 400
- 6 - Power plant
- 7 - Shoe factory
- 8 - Mattress factory
- 9 - "Ubek" fuel depot (sic)
- 10 - "Nefte Base" fuel depot
- 11 - Gasoline depot
- 12 - Grain siloes
- 13 - Pushkin theatre
- 14 - Housing units
- 15 - Institute for Road Construction
- 16 - Natural gas research institute
- 17 - Main street with streetcar line leading to town center
- 18 - Leninskaya Ulidza
- 19 - Astrakhanskaya Ulidza
- 20 - Road to Kamyshin
- 21 - Airfield
- 22 - Shunting station and freight yard
- 23 - Tula -Uralsk railroad line
- 24 - Kuibyshev-Stalingrad railroad line
- 25 - Railroad bridge
- 26 - Sand pit

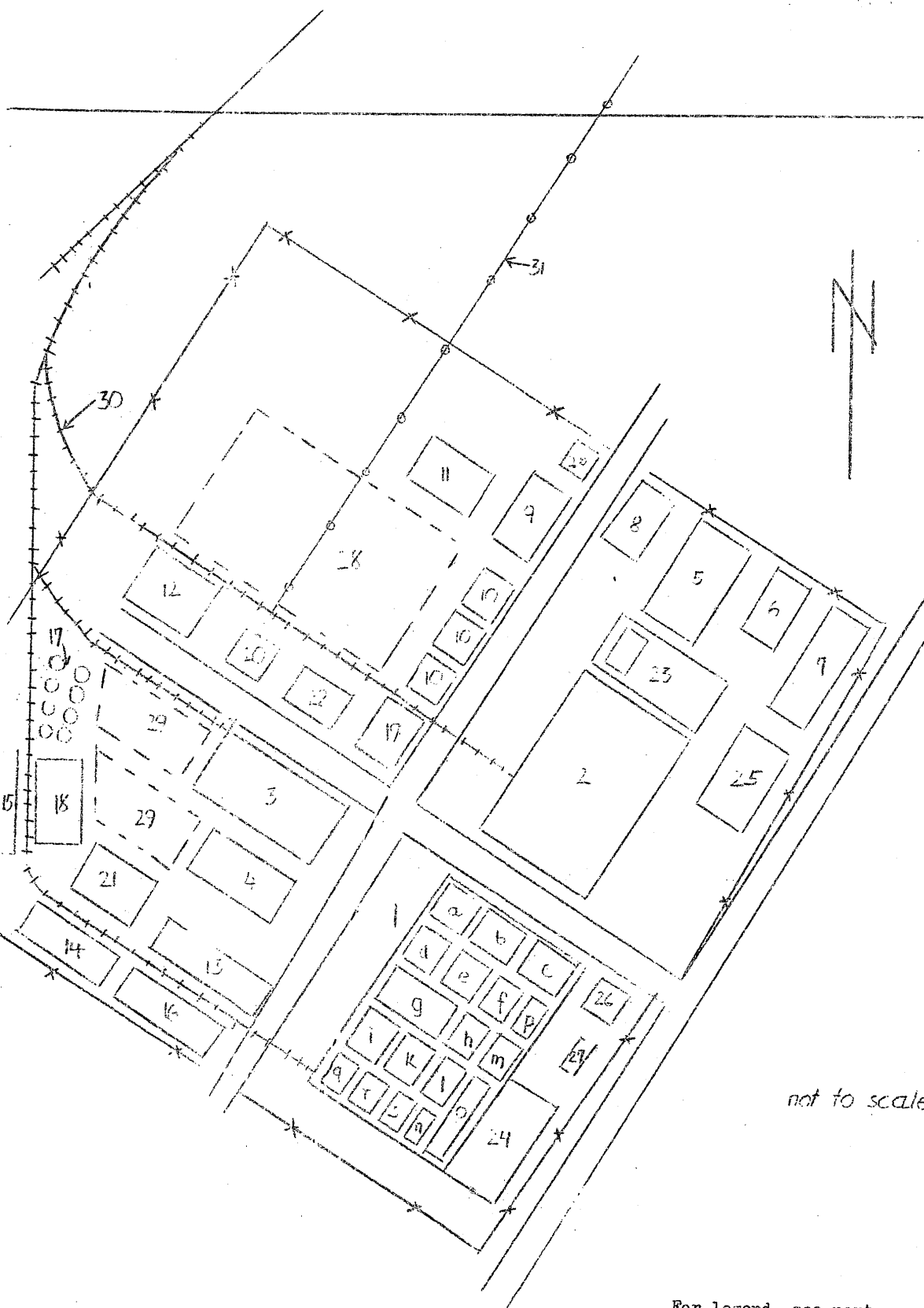
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Layout Sketch of GPS No 3 Saratov Ball Bearing FactoryLegend.

- 1 - Block A - old production department
  - a. Subdepartment 11 - storage of grinding stones and polishing shop
  - b. Subdepartment 25 - Precision mechanic shop and milling shop equipped with 5 milling machines, 10 lathes, 12 to 15 boring and planing machines, and 1 Italian grinding machine
  - c. Subdepartment 2 - foundry equipped with an electric steel furnace, 3 large cupola furnaces for iron and steel casting, 1 small smelting furnace, and 10 to 12 punches.
  - d. Subdepartment 10 - Race punching shop equipped with 2 sheet metal cutting machines, 15 punch presses, 1 oil and acid bath.
  - e. Subdepartment 14 - Ball punching, turning and grinding shop equipped with a heavy ball punch, 3 small ball punches, and 5 German grinding machines.
  - f. Subdepartment 24 - Roller turning and grinding shop equipped with 18 automatic machines, 20 to 25 German and American grinding machines, 5 to 10 polishing and honing machines, 1 oil bath.
  - g. Subdepartment 12 - hardening shop equipped with 12 German hardening furnaces, 8 Russian and Italian (Falschi) hardening furnaces, 4 electromagnetic Siemens hardening furnaces, 3 ladles, and 1 oil bath.
  - h. Subdepartment 16 - turning and assembly shop equipped with several modern lathes.

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Annex 2

- i. Subdepartment 1 -- Assembly shop for ball bearings with a race diameter of up to 8 cm, equipped with 15 to 20 lathes, 28 automatic machines, and numerous autogenous and electric welding units.
- k. Subdepartment 13 -- Assembly shop for ball bearings with races of over 8 cm in diameter, equipped with 24 lathes, 50 grinding machines, numerous polishing and conditioning machines, 15 automatic machines from Plauen and Chemnitz, and numerous welding units.
- l. Subdepartment 15 -- Assembly shop for roller and pin bearings equipped with 5 circular lathes, 4 to 5 American 2 to 3-meter lathes, 12 to 13 German turret lathes, 3 carpenter's benches, 4 to 5 rolling machines, 10 to 12 German automatic machines, 6 American automatic machines, and autogenous and electric welding units.
- m. Control shop equipped with 7 or 8 testing units.
- n. Consumer goods depot
- o. Packing room
- p. Laboratory
- q. Steel depot
- r. Metal depot
- s. Rejects dump
- t. Block C -- New production department equipped with 2 annealing and hardening furnaces, 1 pneumatic hammer, 2 steam hammers, 9 punching machines (3 of them of German make, 1 of American make), about 60 lathes, 60 to 70 grinding machines, several curvature grinding machines, numerous rolling machines, 10 polishing machines, several automatic extrusion presses, 15 to 20 planing and milling machines, 10 to 12 boring machines, 16 four-spindle and six-spindle lathes, 4 to 5 special automatic machines, and 4 to 6 Inter machines.

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Annex 2

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- 3 - Department 17 - old forge
- 4 - Department 27 - new forge

The two forges were equipped with one 5-ton electric traveling crane, 12 foundry furnaces and forging furnaces, 9 electric annealing furnaces (one of American make, the other 8 Jungnickel-Solingen make), 40 hardening furnaces, 1 large powered pneumatic hammer, 3 small powered pneumatic hammers, 2 x 3-ton steam hammers, 3 x 2-ton steam hammers, 4 large pneumatic forging presses, 12 high-speed presses (four of them of American make, the other eight of Koenig & Bauer make), 4 to 5 large punching machines (one American and seven of Russian make), 7 Soviet punching machines, 8 to 9 small punches (four of them of American "National" make), 5 to 6 lathes, 2 race expanding machines, 12 grinding machines, 2 to 3 automatic machines from Saxony.

- 5 - Department 7 - mechanical workshop equipped with 2 annealing furnaces, 1 light press, 40 lathes, 1 spindle lathe, 10 milling machines, 5 boring machines, 2 lathes, 1 punching machine, 1 fly cutter, 5 special automatic machines of Swedish and American make.
- 6 - Department 18 - electrical workshop equipped with one 5-ton electric truck, electric machines, tools and appliances of Siemens-Schuckert make.
- 7 - Department 28 - machinery and spare part shop equipped with 1 heavy traveling crane, 4 annealing furnaces, 4 hardening furnaces, 2 pneumatic hammers, 4 German special lathes, 7 conventional lathes, 1 engine lathe, 1 carpenter's bench, 4 planing machines of Fischer make, 10 boring machines, 2 milling machines, 2 small shaping machines, 4 punches, 2 sheet metal rolls, 2 iron saws, 5 welding units.
- 8 - Motor vehicle repair shop
- 9 - Fire brigade

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Annex 2

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- 10 - Garages accomodating several 4-ton and 6-ton Buessing, MAG, and Krupp trucks, 5 ZIS 5-ton trucks including 2 tipping trucks, 24 ZIS 3-ton trucks, 8 to 10 Ford 2-ton and 3-ton trucks, 15 ZIS 1.5-ton trucks, 3 Stalinez Diesel tractors, 1 American caterpillar tractor, 1 American tank transformed into a tractor, 2 six-seater ZIS sedans, 1 "Pobeda" ZIS sedan, 2 old ZIS sedans.
- 11 - Machine and spare part depot
- 12 - Block K - steel and materials depot
- 13 - Finished products depot
- 14 - Supply depot
- 15 - Small iron parts depot
- 16 - Chemical depot
- 17 - Oil depot
- 18 - Block J - Saw mill, wood-working department and box factory
- 19 - Power plant with 2 turbines
- 20 - Transformer station with 6 transformers
- 21 - Boiler house equipped with 7 to 8 semiportable boilers, and 3 natural-gas burning boilers
- 22 - Compressor station
- 23 - Water pumping station and water reservoir
- 24 - Administration building containing offices, kitchen, mess hall, first aid station, sick bay, and day rooms
- 25 - Block L - factory police station
- 26 - Two guard houses
- 27 - Kennel
- 28 - Lumber yard
- 29 - Two scrap dumps
- 30 - Rail connections
- 31 - High voltage line

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